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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PUBLIC ROADS
DIVISION OF AGRICULTURAL ENGINEERING

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MONTHLY NEWS LETTER

WASHINGTON, D. C., JUNE 21, 1926.

W. W. McLAUGHLIN VISITED SOUTHERN CALIFORNIA AND SPENT SOME TIME WITH H. F. BLANEY IN LOOKING OVER AREAS THAT HAD BEEN TREATED WITH COMPRESSED AIR TO BREAK AND LOOSEN SUBSOIL. MR. McLAUGHLIN ALSO VISITED RENO, NEVADA, TO CONSULT WITH F. L. BIXBY REGARDING THE COOPERATIVE WORK IN NEVADA.

H. F. BLANEY DID SOME PRELIMINARY WORK IN CONNECTION WITH A STUDY OF THE USE OF WATER IN SAN FERNANDO VALLEY, CALIF., IN COOPERATION WITH THE CITY OF LOS ANGELES, TAKING SOIL SAMPLES ON RANCHES GROWING ALFALFA AND ORANGES.

D. W. BLOODGOOD STATES THAT THE COTTON ACREAGE IN MESILLA VALLEY, NEW MEXICO, WILL BE GREATER THAN IT WAS LAST YEAR. MR. BLOODGOOD VISITED ESTANCIA, NEW MEXICO, IN ORDER TO INSTRUCT THE COOPERATOR IN GETTING THE PUMPING PLANT IN OPERATION, SOIL SAMPLING, IRRIGATING THE EXPERIMENTAL PLATS, MEASURING WATER, RECORDING DATA, ETC.

A. L. FELLOWS, WHO VISITED THE WICHITA FALLS, TEXAS, IRRIGATION PROJECT, STATES THAT HE WAS VERY FAVORABLY IMPRESSED WITH THAT PROJECT, PARTICULARLY ON ACCOUNT OF ITS ABUNDANT WATER SUPPLY, THE HIGH CLASS OF WORK DONE, AND THE REASONABLENESS OF THE CHARGE, WHICH IS \$35 PER ACRE PAYABLE IN 35 YEARS WITH 6 PER CENT INTEREST. THE LANDS HAVE BEEN RAPIDLY IRRIGATED AND IMPROVED, OVER 70 PER CENT BEING ACTUALLY IRRIGATED WITHIN TWO YEARS OF THE TIME OF FURNISHING WATER.

THE BERKELEY OFFICE HAS RECEIVED A COPY OF TEKNISK TIDSKRIFT VÄG- OCH VATTENBYGGNADSKONST OF APRIL 24, 1926, PUBLISHED IN STOCKHOLM, SWEDEN, CONTAINING AN ARTICLE "OM HOFF'S HYDROMETRISKA FLYGEL," BY ERIK LINDQUIST. THIS ARTICLE DESCRIBES AND ILLUSTRATES SEVERAL TYPES OF THE PRICE METER AND THE HOFF METER, AND INCLUDES PICTURES OF THE RATING STATIONS AT BERKELEY, CALIFORNIA, AND FORT COLLINS, COLORADO. AFTER REFERRING TO THE LIMITATIONS OF THE PRICE METER AS FOUND IN MR. SCOBIE'S FIELD EXPERIMENTS, MR. LINDQUIST DESCRIBES MR. HOFF'S METER IN CONSIDERABLE DETAIL, AND GIVES THE RESULTS OF RATINGS OF A HOFF METER AT THE TWO AMERICAN STATIONS AND AT THE WELL-EQUIPPED GOVERNMENT STATIONS AT STOCKHOLM AS FOLLOWS:

FORT COLLINS	$0.8 < N < 5$; v 0.288 N.
STOCKHOLM	$1.4 < N < 11$; v 0.290 N.
BERKELEY	$1.3 < N < 11$; v 0.291 N.

R. L. PARSHALL AND CARL ROHWER MADE A TRIP TO THE ARKANSAS VALLEY, COLORADO, FOR THE PURPOSE OF MAKING A PRELIMINARY CALIBRATION OF THE NEW 10-FOOT IMPROVED VENTURI FLUME ON THE DYE LAKE OUTLET NEAR ROCKY FORD. THIS STRUCTURE, WHICH IS OF REINFORCED CONCRETE OF VERY SUBSTANTIAL CONSTRUCTION, IS USED TO MEASURE THE WATER FROM THIS LAKE TO THE RIVER IN EXCHANGE FOR AN EQUAL AMOUNT DIVERTED FROM THE RIVER IN THE HOLBROOK CANAL AT A POINT SOME 6 MILES UP THE RIVER, AND HAS REPLACED AN OLD ORDINARY RATING FLUME WHICH HAD NEVER GIVEN CONSISTENT RESULTS ON ACCOUNT OF THE FILLING IN AND CUTTING OUT OF DEPOSITS ON THE FLOOR OF THE STRUCTURE.

WHILE IN THE ARKANSAS VALLEY, MESSRS. PARSHALL AND ROHWER MADE THREE RATINGS TO CHECK UP THE DISCHARGE THROUGH THE 10-FOOT IMPROVED VENTURI FLUME IN THE LAS ANIMAS CONSOLIDATED DITCH NEAR LAS ANIMAS. THE FOLLOWING RESULTS WERE OBTAINED:

H_A	CURRENT METER OBSERVATION	COMPUTED DISCHARGE
1.15	49.80	50.00
1.71	96.12	95.10
1.99	120.4	121.4

CARL ROHWER HAS BEEN DESIGNING A COPPER LINING FOR THE 85-FOOT CIRCULAR CONCRETE EVAPORATION RESERVOIR AT THE FORT COLLINS, COLORADO, CO-OPERATIVE LABORATORY. PREVIOUS EXPERIMENTS ON THE EVAPORATION FROM THE RESERVOIR INDICATE THAT MR. SLEIGHT'S COEFFICIENT MAY BE EXTENDED TO A RESERVOIR OF THIS SIZE, BUT SINCE THERE WAS SOME DOUBT AS TO THE EFFECTIVENESS OF THE WATERPROOFING, IT IS HOPED THAT A COPPER LINING OF THE RESERVOIR WILL ELIMINATE THIS CHANCE OF ERROR AND MAKE IT POSSIBLE TO DETERMINE THE LIMITS TO WHICH THESE COEFFICIENTS MAY BE SAFELY EXTENDED.

A. T. MITCHELSON IS MAKING A TRIP THROUGH THE NORTHWESTERN STATES TO OBTAIN FURTHER DATA ON CANAL CLEANING AND LINING.

THE FOLLOWING REPORTS HAVE BEEN RECEIVED AT THE BERKELEY OFFICE:

"RETURN SEEPAGE INFLOW INTO BEAR RIVER IN CACHE VALLEY, UTAH,"
BY W. W. McLAUGHLIN AND GEORGE D. CLYDE.

"REPORT OF IRRIGATION INVESTIGATIONS IN SACRAMENTO-SAN JOAQUIN DELTA, SEASON OF 1925," BY O.V.P. STOUT, FRANK DAVIS, AND L. N. BROWN.

"PROGRESS REPORT ON THE EVAPORATION FROM A FREE WATER SURFACE",
BY CARL ROHWER.

"COTTON IRRIGATION INVESTIGATIONS, SEASON 1925, PROGRESS REPORT
BY D. W. BLOODGOOD.

R. J. CARROLL and CARL RORER made a trip to the Arkansas Valley, Colorado, for the purpose of making a preliminary examination of the proposed improved Venturi canal in the Las Animas Valley. This structure, which is to be built of concrete or very substantial steel, is to be used to regulate the water flow into the river in exchange for an equal amount diverted from the river to the Colorado Canal. At a point some 5 miles up the river, and has been located in old order. Rating films which have been taken show that there is no possibility of the filling in and cutting out of debris on the floor of the structure.

While in the Arkansas Valley, Messrs. CARROLL and RORER made their ratings to check up the discharge of the proposed improved Venturi canal in the Las Animas Consolidated Ditch near Las Animas. The following results were obtained:

Computed Discharge	Current Meter Observation	H
30.00	18.20	1.15
88.10	54.45	1.71
151.4	150.4	1.50

CARL RORER has been designing a current rating for the proposed circular concrete Venturi structure at the Fort Collins, Colorado, for comparative investigation. Previous experiments on the Venturi in this and elsewhere indicate that the discharge coefficient may be taken as 0.9. However, on this size, but since there was some doubt as to the coefficient used in the Venturi, it is hoped that a further rating of the structure will eliminate this chance of error and make it possible to determine the limit to which these coefficients may be safely extended.

A. T. MITCHELL is making a trip through the Northwestern States to obtain further data on canal cleaning and lining.

The following reports have been received at the Bureau of Reclamation:

- Report on the flow into Bear River in Cache Valley, Utah, by W. W. McLaughlin and George A. Carter.
- Report of irrigation investigations in Sacramento San Joaquin Delta, Season of 1925, by D. V. Stout, Frank Davis, and J. H. Brown.
- Progress report on the investigation from a "Red River Survey" by Carl Rorer.
- "Cotton Irrigation Investigations, Season 1925, Progress Report" by D. H. Stoughton.

MR. McCORRY LEFT WASHINGTON, JUNE 10 FOR AN EXTENDED TRIP TO THE PACIFIC COAST DURING WHICH HE WILL ATTEND THE ANNUAL MEETING OF THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS AT TAHOE, CALIFORNIA. ENROUTE TO CALIFORNIA HE HELD CONFERENCES WITH MR. YARNELL AT IOWA CITY AND MR. FELLOWS AT DENVER AND ATTENDED AT SALT LAKE CITY A GENERAL CONFERENCE ON THE STATUS OF OUR WORK WITH REGARD TO THE DRAINAGE OF IRRIGATED LAND. MR. McCORRY, AFTER THE A.S.A.E. MEETING, WILL RETURN TO WASHINGTON VIA THE NORTHERN ROUTE, VISITING THE PYROTOL PLANT AT DUPONT, WASHINGTON, AND OTHER POINTS WHERE WE HAVE WORK IN PROGRESS. HE IS NOT EXPECTED TO RETURN TO WASHINGTON BEFORE THE LATTER PART OF JULY.

MESSRS. BOYD AND KINSMAN, BEING ALREADY IN THE WEST, WILL ALSO ATTEND THE A.S.A.E. MEETING AT TAHOE. MR. BOYD'S TRIP IS IN CONNECTION WITH PYROTOL DISTRIBUTION AND MR. KINSMAN IS CONCERNED WITH THE INVESTIGATION OF COMBINED HARVESTER-THRESHERS, A STUDY WE ARE CARRYING ON IN COOPERATION WITH THE BUREAU OF AGRICULTURAL ECONOMICS AND THE BUREAU OF PLANT INDUSTRY. MR. KINSMAN WILL PRESENT A PAPER BEFORE THE MEETING AS WILL ALSO MR. D. G. MILLER, DRAINAGE ENGINEER.

R. D. MARSDEN HAS RETURNED FROM A TWO MONTHS' FIELD INVESTIGATION WITH MR. R. P. TEELE OF THE BUREAU OF AGRICULTURAL ECONOMICS, ON THE AGRICULTURAL DEVELOPMENT OF DRAINAGE DISTRICTS IN THE MISSISSIPPI VALLEY. THIS IS A CONTINUATION OF THE STUDY THAT MESSRS. TEELE AND MARSDEN MADE IN THE SOUTHEASTERN STATES.

B. S. CLAYTON HAS BEEN ASSIGNED TO MAKE A SURVEY OF A FLOOD PREVENTION PROJECT ON THE WOLF RIVER IN WISCONSIN. THIS IS A COOPERATIVE PROJECT WITH THE UNIVERSITY OF WISCONSIN.

P. T. SIMONS PRESENTS THE FOLLOWING RUN-OFF DATA IN REGARD TO DITCH No. 19 OF THE CYPRESS CREEK DRAINAGE DISTRICT, ARKANSAS:

"SEVEN GAGINGS ARE FOR STAGES BETWEEN 5 FEET AND 13 FEET WHILE 1 GAGING WAS FOR 3.9 FEET STAGE. FOR THE LOW STAGE GAGING THE SLOPE COURSE WAS DIVIDED INTO 2 REACHES, LOWER PORTION 700 FEET LONG AND UPPER PORTION 1000 FEET. RESULTS OF THE CALCULATIONS AND GAGINGS ARE SHOWN IN THE FOLLOWING TABLE:

GAGING No.	DATE : (1925)	GAGE HEIGHT	AVERAGE SURFACE	DISCHARGE SEC. FT.	MEAN VELOCITY	SLOPE	KUTTER'S "N"
:	:	:	WIDTH :	:	:	:	:
5	: MAY 11:	7.7	: 99.3	: 786.3	: 1.59	:.000148	:.034
6	: MAY 12:	7.1	: 95.8	: 512.9	: 1.20	:.00011	:.0362
8-A	: OCT. 14:	3.9	: 68.7	: 115.0	: .79	:.00037	:.055467 (LOWER)
8-B	: " 14:	3.9	: 65.4	: 115.0	: .57	:.000098	:.052532 (UPPER)
9	: " 18:	9.8	: 106.6	: 790.2	: 1.16	:.000059	:.035976
11	: NOV. 7:	12.7	: 115.7	: 1865.7	: 1.84	:.00009	:.034369
12	: " 19:	5.0	: 74.5	: 204.4	: .91	:.000101	:.030517
13	: DEC. 15:	11.0	: 111.2	: 1141.1	: 1.38	:.000055	:.032378
	: (1926):	:	:	:	:	:	:
14	: JAN. 22:	11.6	: 112.9	: 1522.2	: 1.71	:.000087	:.033787

Mr. McGowan left Washington June 10 for an extended trip to the Pacific Coast where he will attend the annual meeting of the American Society of Agricultural Engineers at Los Angeles, California. Enroute to California he will stop at Salt Lake City, Utah, and at Denver, Colorado, and attend at Salt Lake City a general conference on the status of our work with regard to the drainage of irrigated lands. Mr. McGowan, after the A.S.A.E. meeting, will return to Washington via the Northern Route, visiting at Everett, Renton, and Everett, and other points where we have work in progress. He is not expected to return to Washington before the latter part of July.

McGowan, Boyd and Kinnaman, being already in the West, will also attend the A.S.A.E. meeting at Los Angeles. Mr. Boyd's trip is in connection with the distribution of the Kinnaman's study on the investigation of some of the water resources of the Northwest. A study on the carrying capacity of the Bureau of Agricultural Economics and the Bureau of Plant Industry. Mr. Kinnaman will present a paper before the meeting as will also Mr. G. Miller, drainage engineer.

R. L. Madison has returned from a two months' field investigation with Mr. G. L. Wells of the Bureau of Agricultural Economics on the agricultural development of drainage districts in the Mississippi Valley. This is a continuation of the study that McGowan, Miller and Madison made in the Northwestern States.

G. E. Clayton has been assigned to make a survey of a flood control project on the Wolf River in Wisconsin. This is a cooperative project with the University of Wisconsin.

P. T. Birney presents the following summary data in regard to ditching in the Oregon-Columbia District, Arkansas:

"Seven basins are for stages between 5 feet and 12 feet while 1 basin was for 5.5 feet stage, for the low stage. During the same period was divided into 2 reaches, lower basin 100 feet long and upper basin 100 feet. Results of the calculations are as follows in the following table:

Basin Data (Case - Lower Columbia District - Arkansas)			
No. of Basins	Length (feet)	Width (feet)	Area (acres)
1	100	100	1.00
2	100	100	1.00
3	100	100	1.00
4	100	100	1.00
5	100	100	1.00
6	100	100	1.00
7	100	100	1.00
8	100	100	1.00
9	100	100	1.00
10	100	100	1.00
11	100	100	1.00
12	100	100	1.00
13	100	100	1.00
14	100	100	1.00
15	100	100	1.00
16	100	100	1.00
17	100	100	1.00
18	100	100	1.00
19	100	100	1.00
20	100	100	1.00
21	100	100	1.00
22	100	100	1.00
23	100	100	1.00
24	100	100	1.00
25	100	100	1.00
26	100	100	1.00
27	100	100	1.00
28	100	100	1.00
29	100	100	1.00
30	100	100	1.00
31	100	100	1.00
32	100	100	1.00
33	100	100	1.00
34	100	100	1.00
35	100	100	1.00
36	100	100	1.00
37	100	100	1.00
38	100	100	1.00
39	100	100	1.00
40	100	100	1.00
41	100	100	1.00
42	100	100	1.00
43	100	100	1.00
44	100	100	1.00
45	100	100	1.00
46	100	100	1.00
47	100	100	1.00
48	100	100	1.00
49	100	100	1.00
50	100	100	1.00

"FOR STAGES ABOVE 7 FEET IN THIS CHANNEL THE MEAN AVERAGE MAXIMUM DEPTH OF WATER IS EQUIVALENT TO THE GAGE HEIGHT WHILE FOR STAGE 3.9 FEET THE DEPTH IS 3.7 IN THE LOWER 700 FEET OF THE SLOPE COURSE, AND 4.5 FEET IN THE UPPER PORTION.

"THIS DITCH IS AN ARTIFICIAL CHANNEL WHICH HAS BEEN IN OPERATION 11 YEARS. THE SOIL IS CLAY AND SILT LOAM. THE CHANNEL WAS DREDGED WITH SIDE SLOPES 1 TO 1 AND 75 FEET BOTTOM WIDTH. AVERAGE DEPTH IS 14 FEET. THE SIDES OF THE CHANNEL HAVE SLIPPED DOWN AND IN UNTIL THE TOP WIDTH WHICH WAS ABOUT 103 FEET IS NOW 120 TO 125 FEET. ON THE UPPER 5 FEET OF CHANNEL SECTION THE SIDE SLOPES ARE ABOUT $1\frac{1}{2}$ TO 1 WHILE ON THE LOWER 9 FEET OF DEPTH IN CHANNEL SECTION THE SIDE SLOPES VARY FROM 5 TO 1 TO 10 TO 1 AND BOTTOM WIDTH VARIES FROM 10 FEET TO 50 FEET. CROSS SECTIONS OF THE CHANNEL ARE NEARLY UNIFORM IN SHAPE EXCEPT TO STATION 510 FROM THE LOWER END OF THE SLOPE COURSE A BAR 3 FEET HIGH HAS FORMED AT THE MOUTH OF A LATERAL DRAIN WHICH EXTENDS MORE THAN HALF ACROSS THE DITCH AND AT STATION 1100 FEET THERE IS A RIDGE NEAR THE CENTER OF THE CHANNEL ABOUT 100 FEET LONG AND 2 FEET HIGH BY 20 FEET WIDE.

"THE SIDES OF THIS CHANNEL ARE SODDED WITH BERMUDA GRASS AND PASTURED WITH CATTLE AND HORSES. THERE ARE BUT FEW WILLOWS, WEEDS, OR BUSHES IN THE CHANNEL. THE VALUE OF "N" IS HIGHEST FOR GAGING 8-A AND 8-B ON ACCOUNT OF VEGETATION ALONG THE BOTTOM OF THE CHANNEL AFTER LONG PERIOD OF DRY WEATHER IN 1925 AND PARTLY ON ACCOUNT OF UNEVEN PLACES IN THE CHANNEL WHICH RETARD THE FLOW MOST AT LOW STAGES. THE VALUE OF "N" IS SMALLEST FOR GAGING 12 WHICH WAS MADE JUST AFTER THE STREAM HAD BEEN AT HIGHER STAGES FOR 2 WEEKS, NOVEMBER 5 TO 19, 1925. THE HIGH WATER HAD SMOOTHED MANY OF THE UNEVEN PLACES WHICH HINDERED THE FLOW OCTOBER 14. THE OTHER 6 VALUES OF "N" ARE QUITE UNIFORM."

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UNIV. OF S. DAK. BUL. SER. 9, No. 6 (1910), 19 p.

For station above 7 feet in this channel the mean average maximum depth of water is equivalent to the same height while for stage 3.9 feet the depth is 5.7 in the lower 700 feet of the slope course, and 4.5 feet in the upper portion.

"This ditch is an artificial channel which has been in operation 11 years. The soil is clay and very loam. The channel was dredged with side slopes 1 to 1 and 15 feet bottom width. Average depth is 14 feet. The sides of the channel have slipped down and in until the top width was about 103 feet in 1925 to 1926 feet. On the upper 5 feet of channel section the side slopes are about 1 1/2 to 1 while on the lower 5 feet of depth in channel section the side slopes vary from 2 to 1 to 10 to 1 and bottom width varies from 10 feet to 50 feet. These sections of the channel are nearly uniform in shape except to station 210 from the lower end of the slope course a bar 3 feet high has formed at the mouth of a lateral drain which extends more than half across the ditch and at station 1400 feet there is a ridge near the center of the channel about 100 feet long and 5 feet high by 20 feet wide.

"The sides of this channel are bordered with Bermuda grass and pastured with cattle and horses. There are but few willows, weeds, or bushes in the channel. The value of "W" is highest for station 8-A and 8-B on account of vegetation along the bottom of the channel after long periods of dry weather in 1925 and partly on account of uneven places in the channel which retard the flow most at low stages. The value of "W" is smallest for station 12 which was made just after the stream had been at higher stages for 5 weeks, November 5 to 15, 1925. The high water was stopped many of the uneven places which hindered the flow October 14. The other 8 values of "W" are quite uniform."

Topography relative to the drainage area - continued.

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